



# Palm Coein Figo Classification System for Causes of Abnormal Uterine Bleeding (AUB) in Non Gravid Women of Reproductive Age Group in a Peri Urban Tertiary Care Hospital

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## ABSTRACT

**Background:** AUB is the most common problem affecting the women of the reproductive age group and directly affecting their life by having a significant impact on their physical, social, and emotional aspects. According to most International Federation of Gynecology and Obstetrics (FIGO) was devised as the most acceptable system of nomenclature and classification of AUB in the year 2011, namely PALM-COEIN classification to describe AUB in the year 2011. The objective of the present study was to find out causes and to categorize the causes of AUB as per the FIGO system in terms of the structural (PALM) and functional (COEIN) components in the Indian scenario.

**Method:** The present study was done retrospectively carried out on 120 non-pregnant reproductive age women with complaints of AUB at Datta Meghe Medical College, Shalinitai Meghe Hospital and Research Centre, Wanadongari, Nagpur, during the period May 2019 to April 2020. The study aims to conduct the efficiency and practicality of the PALM-COEIN classification system for a patient showing AUB at the outpatient department.

**Results:** It is a retrospective study carried out on 120 patients presenting with complaint of abnormal uterine bleeding. Upon classification of the patients according to the PALM-COEIN classification, Leiomyoma was found to be the most common cause of AUB in patients with gynae OPD (n=38, 31.6%) was followed by ovulatory dysfunction was followed by (n=28, 23.4%), Adenomyosis (n=22, 18.4%), Endometrial causes (n = 13, 10.82%), Polyp (n=8, 6.6%), Not yet classified (n=7, 5.8%), Iatrogenic (n =2, 1.6%), Malignancy and Coagulation (n = 1, 0.83%). About 69 (57.5%) patients had structural (PALM) causes of AUB in our study and 51 (42.5%) are non-structural cause (COEIN).

**Conclusion:** The PALM COEIN classification system of AUB for determining diagnosis of causes and helps us to facilitate proper management of women with a broad group of disorders included under acute and chronic AUB Leiomyoma was found to be the most common cause of AUB in patients with gynae OPD after classification of the patients according to the PALM-COEIN classification.

**Key Words:** Abnormal Uterine Bleeding, Dysfunctional uterine bleeding, Endometrial, Menstrual disorders, Polyp, Adenomyosis, Leiomyoma, Malignancy

## INTRODUCTION

AUB is the most common health problem in reproductive age women and their families which causes frequent visits for gynaecological consultation. The incidence of abnormal

uterine bleeding (AUB) in the reproductive age group is 14% to 25% and in perimenopausal women are up to 50%. AUB is the significant cause for almost two-thirds of all hysterectomy.<sup>1,2</sup> AUB is characterized as uterine corpus bleeding that is irregular in regularity, volume, and fre-

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quency or duration that occurs without pregnancy or after menopause in frequency, duration, and amount of blood flow. Acute AUB is characterized as bleeding in a reproductive-age non-gravid woman of sufficient quantity to require urgent intervention to avoid further loss; Chronic AUB is described as bleeding from the uterine corpus that is irregular in length, volume and/or frequency and has been present for most of the preceding 6 months.<sup>3</sup> Previously, words such as menorrhagia, metrorrhagia, and abnormal uterine bleeding have been used to define AUB, because of increasing issues and difficulties in planning international clinical trials and understanding independent research studies using such terminologies, it has been suggested that simple terms with straightforward definitions have a potential to understand Patients and health practitioners alike can be translated into most languages. Prior to this, a formal and clear diagnosis of the underlying etiology was missing in women with reports of severe menstrual bleeding. This analysis discusses the usage of the FIGO classification of causes of irregular uterine bleeding and supports this.<sup>4</sup> Abnormal uterine bleeding (AUB) is a common reproductive-age issue among women. This impacts the Indian population by 17.6 %.

The working group of the International Federation of Gynaecology and Obstetrics (FIGO) has developed a classification system for AUB causes in non-gravid females (PALM-COEIN)<sup>5</sup>. The structural anomaly means PALM can be visually identified by imaging methods, clinical examination, or histopathology. Imaging or histopathology cannot be used to define the categories indicated by the COEIN group. There are nine main groups, the acronym PALMCOEIN says: Polyp; adenomyosis; leiomyoma; hyperplasia and malignancy; coagulopathy; ovulatory dysfunction; endometrial; iatrogenic; and still not named. This classification method has the advantage of classifying and proper management in tertiary care hospitals.<sup>6</sup>

**Table 1: Categories in PALM-COEIN classification**

Categories	
Structural causes	
P	Polyp
A	Adenomyosis
L	Leiomyoma
M	Malignancy and hyperplasia
Non-structural causes	
C O E I N	Coagulopathy Ovulatory dysfunction Endometrial Iatrogenic Not yet classified

PALM-COEIN: Polyp, Adenomyosis, Leiomyoma, Malignancy and Hyperplasia Coagulopathy, Ovulatory dysfunction, Endometrial, Iatrogenic, Not yet classified

## Polyps

Polyp means that epithelial proliferation is a variable component of the vascular, glandular, and fibrotic and connective tissue, and often asymptomatic polyps are. Polyps are diagnosed as being either absent or present by ultrasound, hysteroscopy or both, treated mostly in conjunction with histopathology. Sub-classification based on the polyp sizes, position, number, morphology, and histology.<sup>7</sup>

## Adenomyosis

Adenomyosis is a condition in which the endometrium's glandular and stromal component grows directly into the myometrium, hence ultrasound diagnosis, magnetic resonance imaging, or histopathology, typically following hysterectomy. Magnetic resonance imaging requirements were also established for adenomyosis with an asymmetric myometrial appearance accompanied by uterine enlargement.<sup>8</sup>

## Leiomyomas

Uterine Leiomyomas are the most common pelvic tumor between the ages of 35-45 years up to 70% of women of reproductive age. Mainly 75 percent of fibroids remain asymptomatic or incidental, many patients have site-related symptoms and tumor size. Surgery is the therapeutic mainstay of symptomatic fibroid treatment.<sup>9,10</sup>

## Malignancy and endometrial hyperplasia

When women with AUB are detected with malignant and pre-malignant processes so that they are classified as FIGO.<sup>11</sup>

## Coagulopathy (systemic disorders of haemostasis)

That group covers the systemic haemostasis disorders which are associated with AUB. While Von Willebrand disease may be a common cause in this group, other coagulopathies may also lead to AUB. Consideration of these conditions is important as gynaecologists are typically not familiar with haemostasis diseases. It's also important to remember whether women are being medicated.<sup>12</sup>

## Ovulatory disorders

Typically women with ovulatory disorders have AUB, which includes both unpredictable bleeding and abnormal flow. Some women, however, can experience amenorrhoea, light and unusual bleeding, and HMB (sometimes unpredictable), which needs medical attention and, in some cases, emergency treatment. The aetiology may involve polycystic ovarian syndrome, hypothyroidism, hyperprolactinemia, mental stress, obesity, post bariatric surgery, post-solid organ transplantation, anorexia or severe exercise.<sup>13</sup>

## Endometrial causes

If a woman with AUB has cyclic ovulatory cycles and no other apparent cause of the bleeding disorder, it should be

assumed that endometrium may be the cause. Most of the causes are related to a deficiency in local vasoconstrictor development, including endothelin-1 and prostaglandin F2a, or excessive plasminogen activator output. Clinicians, however, do not have access to several screening tests for these conditions.<sup>14</sup>

### Iatrogenic

The use of intrauterine contraception (copper- or levonorgestrel-releasing); gonadal hormones such as hormonal contraceptives; anticonvulsants and antibiotics (rifampicin, griseofulvin); tricyclic antidepressants (amitriptyline, nortriptyline) and phenothiazines should be taken into account for this classification and anticoagulants such as warfarin, heparin, and heparin with low molecular weight.

### Not classified

These are either uncommon or misdefined. This group includes other essential causes of AUB, such as chronic endometritis, endometrial pseudoaneurysms, arteriovenous malformations, and myometrial hypertrophy. The potential causes were listed and the patients classified accordingly, according to the PALM-COEIN classification scheme. Patients diagnosed with polyp, adenomyosis, and leiomyoma were classified under AUB-P, AUB-A, and AUB-L respectively as per speculum and vaginal examination followed by ultrasound. Bleeding due to endometrial carcinoma diagnosed on histopathological inspection after either endometrial biopsy or hysterectomy was listed under the group AUB-M.

Patients taking anticoagulants and having coagulation disorders from younger age were classified under the category AUB-C. Bleeding with erratic, irregular timing, and volume variable was suspected to be caused by ovulatory dysfunction and reported under AUB-O. When irregular menstrual bleeding occurred in cyclical and repetitive patterns that are characteristic of ovulatory cycles and no other cause is known, it was deemed an endometrial condition and put under AUB-E. Patients with abnormal bleeding due to gonadal hormonal intake of steroids during the preceding 3 months or due to the use of inert or medicated intrauterine devices were classified as iatrogenic and grouped under AUB-I. Women that did not fit into either category were grouped under the category that was not yet categorized.<sup>6</sup>

**BMI:** obesity and overweight were defined according to WHO criteria modified for the Indian population, Underweight <18.5, Normal 18.6 to 22.9 %, Overweight 23 to 24.9 and obese >25.<sup>15</sup>

## AIMS OF STUDY

The aim of this study was to categorization of women with causes of AUB in the reproductive age group according to PALM COEIN classification.

## OBJECTIVE OF STUDY

To assess clinical advantages and the availability of the PALMCOEIN classification system for better diagnosis and proper treatment of AUB.

## MATERIAL AND METHODS

The current retrospective study was conducted at the Obstetrics and Gynecology at Datta Meghe Medical College, Shalinitai Meghe Hospital and Research Centre, Wanadongari, Nagpur in collaboration with Datta Meghe Institute of Medical Science over the period May 2019 to April 2020. During this study, 120 women were enrolled in the present study who met the inclusion criteria. All these cases were placed in the nine categories of the PALM-COEIN classification

### Inclusion criteria

- Women age between 18 to 50 years
- History of unpredictable, irregular menses with excessive bleeding for the prolonged duration for at least 3 months.
- Increased frequent menstrual cycle, abnormal duration, as well as intermenstrual bleeding for at least 3 months of duration.

### Exclusion criteria

- Bleeding caused by pregnancy and pregnancy-related factors.
- Bleeding caused by vaginitis.
- Bleeding caused by cervical diseases

Informed and written (Marathi and English) consent was obtained from each patient after ethical committee clearance was taken. The study was has not been imposed any burden on the subject and the institute, so that data collected from patients was kept confidential. The detailed history of these patients was taken, such as menstrual history, obstetric history, medical history, surgical history including drug history, physical, and local examination done. And related clinical examination and laboratory test results were collected, including regular blood checks, hormonal assays, vaginal ultrasound, liver function, renal function, hysteroscopic examination, and histopathology study. At the same time, a lecture and training were performed on AUB-related principles, and a menstrual record report was distributed to the patients for 3 months to be held as a menstrual journal. The data were extracted from the report form of the case and inserted in the excel sheet.

## RESULTS AND DISCUSSION

The aim of this study was to assess clinical advantages and the availability of the PALMCOEIN classification system.

Longstanding confusion about terminology and definitions relating to AUB because of that FIGO classification system was developed. As per the old classification system, It was not clear about terms such as menorrhagia, metrorrhagia, polymenorrhagia menometrorrhagia, and dysfunctional uterine, as well as these terms, did not give information about the etiology, diagnosis, and treatment of the AUB which leads to confusion.

This study mainly focus onto categorize the patient of AUB according to FIGO classification and it is similar to studies by Khrouf et al.<sup>16</sup>, Munro et al.<sup>5</sup>, Madha et al.<sup>6</sup>, Bahamondes and Ali.<sup>17</sup> With this, needed investigations can be done and proper management for specific causes can be planned.

During the study, 120 patients were included after fulfilling all the inclusion criteria.

**Table 2: Age distribution of study population.**

Age group (years)	Overall, n=120	100 %
<20 years	3	2.5%
20-29 years	8	6.67%
30-39 years	43	35.84%
40-49 years	56	46.67%
>49	10	8.33%

### Age Distribution

All these cases were placed in the nine categories of the PALM-COEIN classification. Maximum patients were in the age group of 40-49 years n=60, (50%), followed by n=43 (38.3%) in 30-39 years. In 20-29 years were about 8(6.7%) and 10 (4.1%) were above 50 years.

In the study by Priyanka Goel et al. maximum patients were in the age group of 40-49 years, 42.33%<sup>18</sup>. The study by Rekha Ratnani et al. majority were 40-50 (70%)<sup>19</sup>. The study by Sudha R et al. have concluded that 70% of patients were in the age group of 40-49 years<sup>20</sup>. Betha K et al. shows that participants in almost half of the women (42%) were in the age group 41-45years<sup>21</sup>. In our study, maximum women were 40-49 (50%). The study done by Dr Archana Singh et al. that shows the majority (43.47%) women were between 45-50 years of age<sup>22</sup>.

**Table 3: Distribution of study population based on BMI**

BMI	Overall n= 120	%
Underweight <18.5	4	3.3 %
Normal 18.6 to 22.9 %	30	25 %
Over weight 23 to 24.9 %	26	21.7 %
Obese >25	60	50 %

In this study, maximum patients belong to the obese group 58.3% and a minimum 3.3% underweight. Normal BMI was 16.7% and overweight was 21.7%.

In the study by Betha K et al. more than half of the women (58%) were obese, in our study also 70 (58.33%) women are obese<sup>21</sup>. In perimenopausal, the excessive adipose tissue deposition increases peripheral aromatization of androstenedione to estrone, elevated estrone levels trigger abnormal feedback in the hypothalamo pituitary axis causing oligo or anovulation. In the absence of ovulation, the endometrium is exposed to continuous estrogen stimulation.<sup>23</sup>

**Table 4: Distribution of study population based on the presented complaint**

Complaint	n= 120	(100%)
Heavy menstrual bleeding	58	48.4 %
Irregular bleeding	43	35.83 %
Intermenstrual spotting	06	5 %
Frequent menses	12	10 %
Postmenopausal bleeding	01	0.81 %

### Menstrual symptoms

The majority of patients complained of regular heavy bleeding as chief complaint 58 (48.4%), 43 (35.8%) each had irregular heavy bleeding, and 12 (10%) were frequent bleeding 01 (0.8%) women had postmenopausal bleeding, 06(5%) women had intermenstrual spotting. Thus menorrhagia was the chief complaint in our study population.

In the study by Priyanka Goel et al. most common presenting complaint was heavy menstrual bleeding was 62%<sup>18</sup>. The study by Rekha Ratnani et al., most of the patients complained of regular heavy bleeding as a chief complaint (43.3%)<sup>19</sup>. In the study done by Tater A et al., the most common presenting complaints of heavy menstrual bleeding was almost 48%<sup>24</sup>. The study done by Archana Singh et al. had mostly the common complaints of heavy menstrual bleeding (67.8%)<sup>22</sup>.

**Table 5: Distribution of study population based on PALM-COEIN classification. PALM-COEIN**

Distribution	n= 120	(100 %)
Polyp	8	6.6 %
Adenomyosis	22	18.4 %
Leiomyoma	38	31.6 %
Malignancy	1	0.83 %
Coagulopathy	1	0.83 %
Ovulatory dysfunction	28	23.4 %
Endometrial	13	10.82 %
Iatrogenic	2	1.6 %
Not known	7	5.8 %



After classifying patients according to the PALM-COEIN classification, leiomyoma was found to be the most common cause of AUB in gynae OPD patients (n=38, 31.6 %). Ovulatory dysfunction was followed by (n=28, 23.4%), adenomyosis (n=22, 18.4%), endometrial causes (n = 13, 10.82%), polyp (n=8, 6.6%), not yet classified (n=7, 5.8%), iatrogenic (n =2, 1.6%), malignancy and coagulation (n = 1, 0.83%). About 69 (57.5%) patients had structural (PALM) causes of AUB in our study and 51 (42.5%) are non-structural cause (COEIN). AUB-L was the major contributor in PALM group, and AUB-O was predominant in COEIN group.

Whereas, in a study done by Gouri et al.<sup>26</sup> in May 2016, the maximum number of patients was ovulatory dysfunction 27% then leiomyoma 24.67%. In the study by Priyanka Goel et al. in 2016,<sup>18</sup> the most common cause of AUB was ovulatory dysfunction 28.33% followed by leiomyoma 22.67%.

In the study by Betha K et al. in 2017, Leiomyoma was the most common cause of AUB (30.4%) followed by Ovulatory disorders (13.6%). The PALM and COEIN groups accounted for 60.4% and 39.6% respectively<sup>21</sup>. The study done by Archana Singh et al. in 2018 show that Leiomyoma was the commonest cause of AUB (36.75%) followed by ovulatory disorder (26%)<sup>22</sup>. According to the study done by Qureshi and Yusuf et al. in 2013, maximum women were classified under leiomyoma category, the number being 25% followed by ovulatory dysfunction 24%<sup>25</sup>. The study done by Rekha Ratnani et al. 2017 leiomyoma (35%) was the main cause of AUB.<sup>19</sup> Betha K et al. shows that leiomyoma was the most common cause of AUB in patients presenting to the gynecology OPD (70%).

In the present study, leiomyoma was the most common cause of AUB in patients presenting to the gynae OPD 31.6%, followed by Ovulatory dysfunction 23.4%, so that 57.5% women had structural (PALM) causes of AUB in our study and 42.5% are nonstructural cause (COEIN).

Whereas, in a study done by Gouri et al.<sup>26</sup> in May 2016, the maximum number of patients was ovulatory dysfunction 27% then leiomyoma 24.67%. In the study by Priyanka Goel et al. in 2016,<sup>18</sup> the most common cause of AUB was ovulatory dysfunction 28.33% followed by leiomyoma 22.67%. In the present study also, the ovulatory cause was 2nd most common.

## CONCLUSION

In our present study, we found that structural (PALM) causes contributed more than non-structural (COEIN) cause of AUB in 40-49 years age group patients. In conclusion, PALM-COEIN classification is a practical way to understand the various causes of AUB, it gives simpler terminology, diagnosis, and investigations of the etiology of AUB and offers appropriate management in the outpatient clinics.

So, this classification needs periodic modification and frequent revision depends upon in advance knowledge, technology, availability of investigation, and therapeutic options across geographic regions. COEIN part of AUB needs more improvement to classify and need further research. This classification needs more improvement in line with classification as well as medical science and technology.

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